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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

HARM, NICKOLAS R

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

10/02/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/563,131	Applicant(s) ARUGA ET AL.	
	Examiner NICKOLAS HARM	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 1-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-10, drawn to a bonding method.

Group II, claim(s) 11-18, drawn to a bonding apparatus.

2. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the corresponding technical feature is the apparatus, which is not special because it is known in the art.
3. During a telephone conversation with Richard Burgujian on September 11, 2009 a provisional election was made without traverse to prosecute the invention of Group II, claims 11-18. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-10 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.
4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim

remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Objections

5. Claim 15 objected to because of the following informalities: the limitation “arranged capably of abutting” is found in lines 4 and 11. This should be changed to “that is capable of abutting”. Appropriate correction is required.
6. Claim 17 objected to because of the following informalities: the limitation “a absorbing-and-holding member” in lines 3 and 5 should be changed to “an absorbing-and-holding member”. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
8. Claims 16 and 18 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
 - a. Claim 16 recites the limitations "the first heating mechanism" and “the second heating mechanism” in lines 3-5 and 7-10, respectively. There is insufficient antecedent basis for this limitation in the claim.
 - b. Claim 18 recites the limitation "the positioning mechanism" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 11, 12, and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over RHEE (US 3,555,666) in view of COUTEAU et al. (US 6,326,313).

a. Regarding claim 11, RHEE teaches a jig that holds two objects together, which is two holding members and a pressurizing mechanism (col. 4, lines 24-27). RHEE teaches a treatment chamber (col. 4, lines 6-7). COUTEAU teaches a treatment chamber with a supply mechanism and discharge mechanism (col. 4, lines 25-43). It would have been obvious to one of ordinary skill in the art at the time of the invention to add COUTEAU's supply and discharge mechanisms to RHEE's treatment chamber because such mechanisms would allow for ease of replacement of the treatment liquid, the concentration of the treatment liquid in

Art Unit: 1791

the treatment chamber will dilute as it reacts with the objects to be bonded, and one of ordinary skill in the art would want to expose each pair of objects to be bound to a treatment liquid of consistent concentration.

b. Regarding claim 12, RHEE teaches that the objects to be bonded are precisely aligned and that the jig maintains the objects' alignment (col. 4, lines 24-27).

c. Regarding claim 14, RHEE teaches supply and drain mechanisms that are used in the process of cleaning the objects to be bonded (col. 4, lines 35-43).

12. Claim 13 rejected under 35 U.S.C. 103(a) as being unpatentable over RHEE and COUTEAU as applied to claim 11 above, and further in view of KELLOGG et al. (US 5,883,361) and STUEBER et al. (US 2002/0105875).

d. Regarding claim 13, KELLOGG teaches a first head member (col. 4, line 25; fig. 2, #31) and second head member (col. 4, line 9; fig. 2, #25) that, respectively, supports a first holding member (fig. 3, #35; fig. 2, #55a and #61a) and a second holding member (fig. 2, #50, #55b, and #61b). KELLOGG teaches a first chamber wall supported by the first head member and arranged to surround the first holding member (col. 4, lines 32-33; fig. 3, #36) and a second chamber wall arranged to surround the second object to be bonded (fig. 2, #21a and #21b). While KELLOGG teaches that the floor (fig. 2, #25) supports both the base of the second holding member (fig. 2, #50) and the second chamber wall (fig. 2, #21a and #21b), affixing the second chamber wall to the base of the second holding member so that the second holding member supports the second

Art Unit: 1791

chamber wall would be an obvious design choice for one of ordinary skill in the art at the time of the invention (MPEP 2144.04). KELLOGG teaches that the first and second chamber walls are attached to one another (fig. 2), so it would have been obvious to one of ordinary skill in the art at the time of the invention that a sealing member exists between the two or is unnecessary in light of the fact that they are directly connected. KELLOGG teaches a seal member between the first holding member and the first chamber wall (col. 4, lines 38-51). STUBER teaches the desirability in a diffusion bonding process of maintaining the surfaces to be diffusion bonded free of oxides (para. 12). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of KELLOGG with that of the references as combined because they are analogous arts and it would be desirable to one of ordinary skill in the art to clean and bond the objects to be bonded in the same chamber in order to reduce contact with oxygen that can occur during transport between a treatment chamber and a bonding chamber.

13. Claims 15-16 rejected under 35 U.S.C. 103(a) as being unpatentable over RHEE and COUTEAU as applied to claim 11 above, and further in view of GRUTTA et al. (US 2003/0175520).

e. Regarding claim 15, the references as combined teach that the objects to be bonded are held by holding members and heated, but not that heat is applied to the objects to be bonded via heating mechanisms that are driven to contact the holding members. GRUTTA teaches bonding a plurality of objects (para. 23)

Art Unit: 1791

by placing the objects between two holding members (para. 25) and a driving mechanism passes the objects and holding members between top and bottom rollers (para. 35; fig. 4) that abut the holding members and then are separated from the holding members as the holding members and objects are passed through the rollers, wherein the rollers pass energy to the holding members to heat the objects to be bonded (para. 26, 35). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the mechanism of conductive heat transfer taught by GRUTTA to heat the objects to be bonded instead of heating the entire chamber as taught by the references as combined, because of increased efficiency of not heating the entire chamber and the reduced wear on the chamber inherent in repetitive heating and cooling of the entire chamber.

f. Regarding claim 16, GRUTTA teaches that the rollers transfer energy to the holding members in order to heat the objects to be bonded (para. 35) and that the rollers are heated by any suitable heating means (para. 26). It would have been obvious to one of ordinary skill in the art at the time of the invention that the rollers are capable of being heated to one temperature prior to contacting the holding members, and subsequently being heated to a different temperature.

14. Claim 17 rejected under 35 U.S.C. 103(a) as being unpatentable over RHEE and COUTEAU as applied to claim 11 above, and further in view of OHKUBO et al. (US 6,032,715).

Art Unit: 1791

g. Regarding claim 17, OHKUBO teaches a holding member that holds a substrate to be bonded in a removable manner by suction (col. 3, lines 20-24). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the holding member taught by OHKUBO as the holding member in the references as combined because vacuum holding plates are well known in the art and one of ordinary skill in the art would desire to hold the objects to be bonded on the holding plates without adhesive or clips that could interfere with the bonding process.

15. Claim 18 rejected under 35 U.S.C. 103(a) as being unpatentable over RHEE and COUTEAU as applied to claim 11 above, and further in view of MASIK (US 5,336,353).

h. Regarding claim 18, MASIK teaches the use of cameras to align two objects to be bonded (col. 4, lines 1-5). It would have been obvious to one of ordinary skill in the art at the time of the invention to use cameras as taught by MASIK in the apparatus of the references as combined because the arts are analogous, visual inspection is a well-known way of determining whether objects are in alignment, and cameras are a known means of automatic visual inspection that is known in arts involving harsh environments, such as those with high temperatures and pressures like those of the references as combined, where a person cannot simply view the objects as they are bonded.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICKOLAS HARM whose telephone number is (571)270-7605. The examiner can normally be reached on Mon-Thurs, 7:30a-5:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip Tucker can be reached on (571)272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NICKOLAS HARM/
Examiner, Art Unit 1791

/Mark A Osele/
Primary Examiner, Art Unit 1791
September 30, 2009